
Kurt J. Lesker[®] Company

KJL SPARC - VACUUM GAUGE CONTROLLER OPERATION MANUAL



YOU MUST READ THIS MANUAL BEFORE USE

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SECTION 1: DESCRIPTION AND PRINCIPLE OF OPERATION

The Kurt J. Lesker SPARC Vacuum Gauge Controller is a highly configurable digital vacuum control instrument capable of driving multiple types of sensors. The SPARC is configured with sensors based on the accuracy and range required to sense vacuum and display the pressure reading in user selectable units of Torr, mbar or kilopascal. The Kurt J. Lesker SPARC can either be panel mounted or sit on a bench top, and can use capacitance diaphragms, Pirani, cold cathode, or cold cathode/Pirani sensors. If in doubt about what gauge sensor you have, consult the Kurt J. Lesker packing list that came with your instrument for positive identification.

Consult the Kurt J. Lesker website www.lesker.com for information about other Kurt J. Lesker vacuum controllers and gauges.

The SPARC configured with a capacitance manometer or other active gauge displays the vacuum level that corresponds to the sensor voltage output.

SECTION 2: CONSTRUCTION

The SPARC consists of the indicating and controlling instrument, the sensor configured, the sensor cable, the output interfaces and an international AC power adapter.

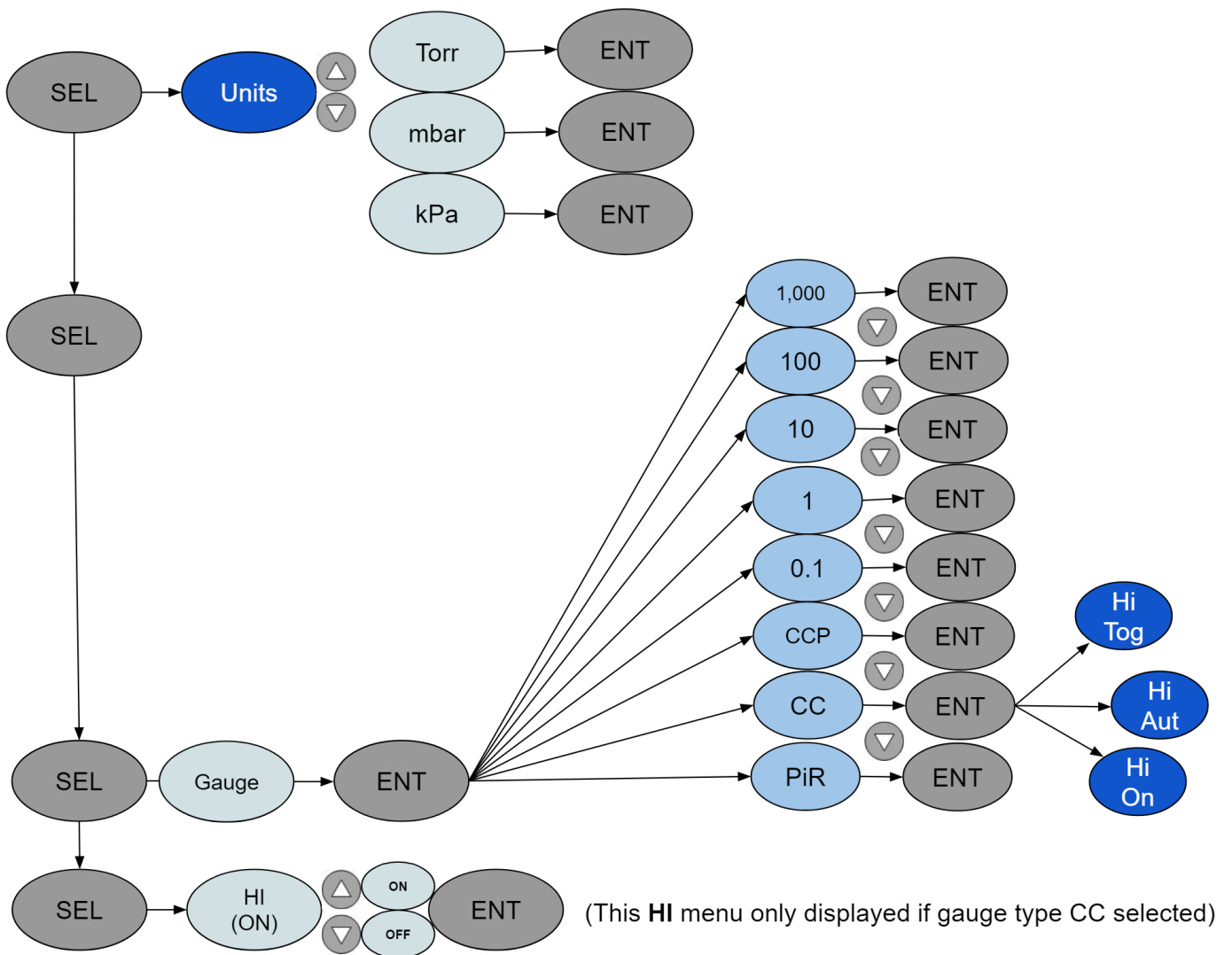
The instrument is housed in a rugged free-standing plastic enclosure. It can either be placed on a suitable surface, or can be mounted in a 1/8" DIN panel cutout. On this model, the connector wiring terminates at the instrument with a 8 position FCC68. Regulating circuitry in the Display Unit provides clean constant current for gauge excitation.

SECTION 3: UNPACKING AND INSPECTING

After the instrument is received, it should be carefully unpacked and inspected for damage during shipment and for completeness. The package should contain, as a minimum, the instrument, the sensor and cable ordered, an AC power adapter and a quick start guide. In the event of a loss during shipment, a claim should immediately be made to the common carrier or the postal service, as applicable. The Display Unit warranty pertains only to the instrument, and does not cover losses in shipping. Each SPARC should come with:

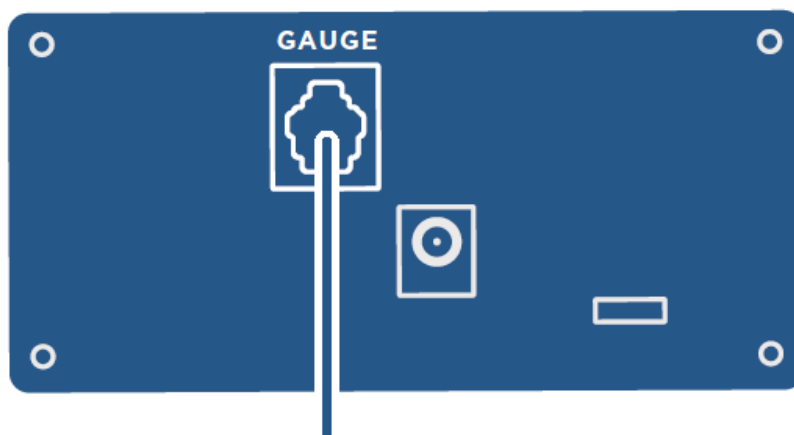
- Display Controller
- 10' Sensor cable
- Power supply with US, AU, UK and EU plug adapters
- Rubber feet and mounting hardware
- Quick Start Guide

MENU TREE



SECTION 4: INSTALLATION

The instrument should be located in a clean, dry environment for best results. The unit can be panel mounted with the hardware provided in a 1/8" DIN panel cutout (3.64" x 1.78" [92mm x 45 mm]). Alternatively, the unit can be placed on a desktop by placing the 4 rubber feet included with your gauge on the underside of the unit. The gauge tube cable should be identified by wire tags or markings specific to your environment.



Please use the supplied 24V AC adapter with your Instrument. This adapter provides clean short protected power to protect and insure accuracy of the internal circuitry.

SECTION 5: OPERATION

After installation, the Display Unit is ready for immediate operation.

Only connect and disconnect cables with the power to the unit unplugged. Make all connections to sensors and relay outputs with the power disconnected. NEVER DISCONNECT SENSOR OR OUTPUT WIRES WHILE UNIT IS POWERED UP.

In cases where the system has contaminants, as is often the case with metalizing and coating equipment, it is often effective to isolate the sensor with a solenoid or manual valve during periods when contamination is most active.



The Display Unit controller can be easily set to the desired units on the fly:

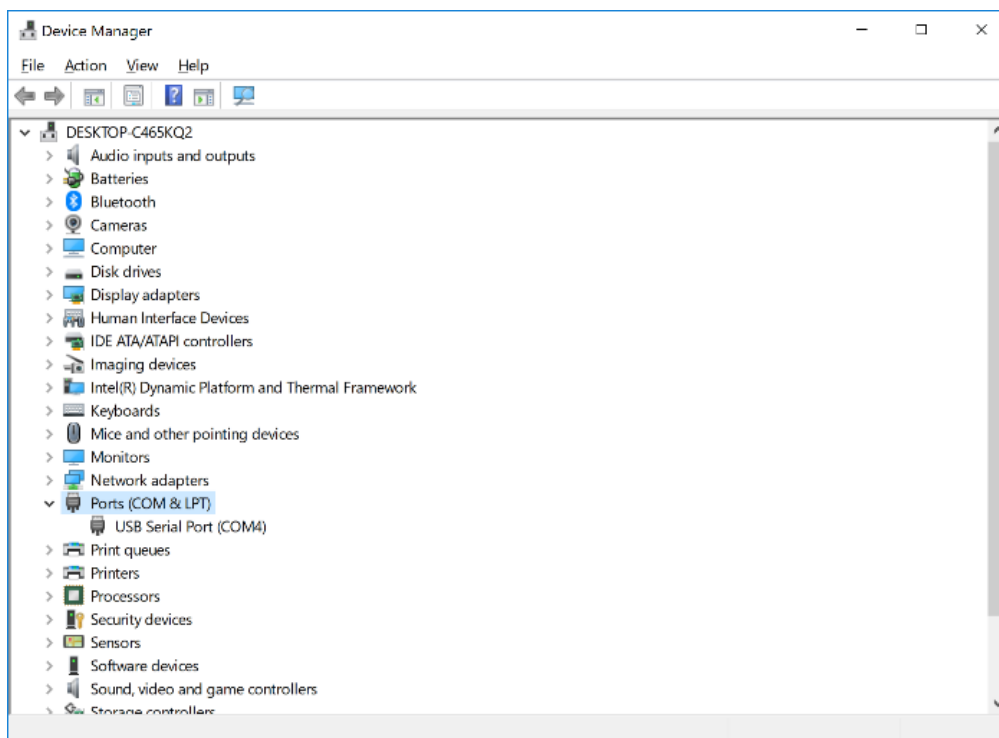
1. Press the "sel" key once during normal operation. The currently selected units will blink
2. Press the "▲" and "▼" to get to the desired unit.
3. Press "Ent" to complete your selection.

One of the units LEDs to the right of the LCD will always be lit during normal operation to indicate which pressure range the display is indicating.

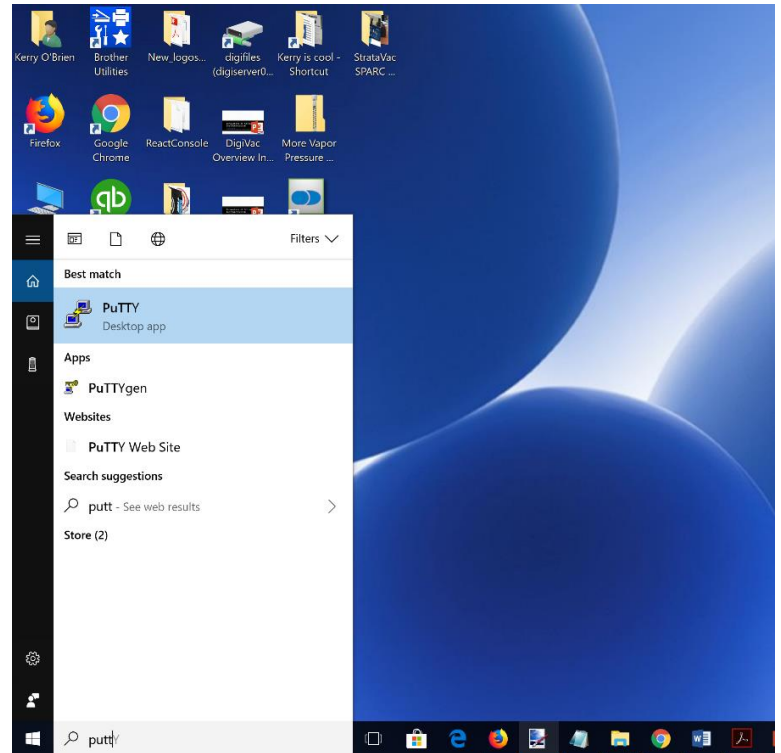
5.1 Communication: USB Connectivity

SPARC has the ability to display vacuum readings on a desktop in real time. To view your vacuum pressures on your desktop, you first must download [PuTTY](#). Once the software is installed on your computer, follow the instructions below.

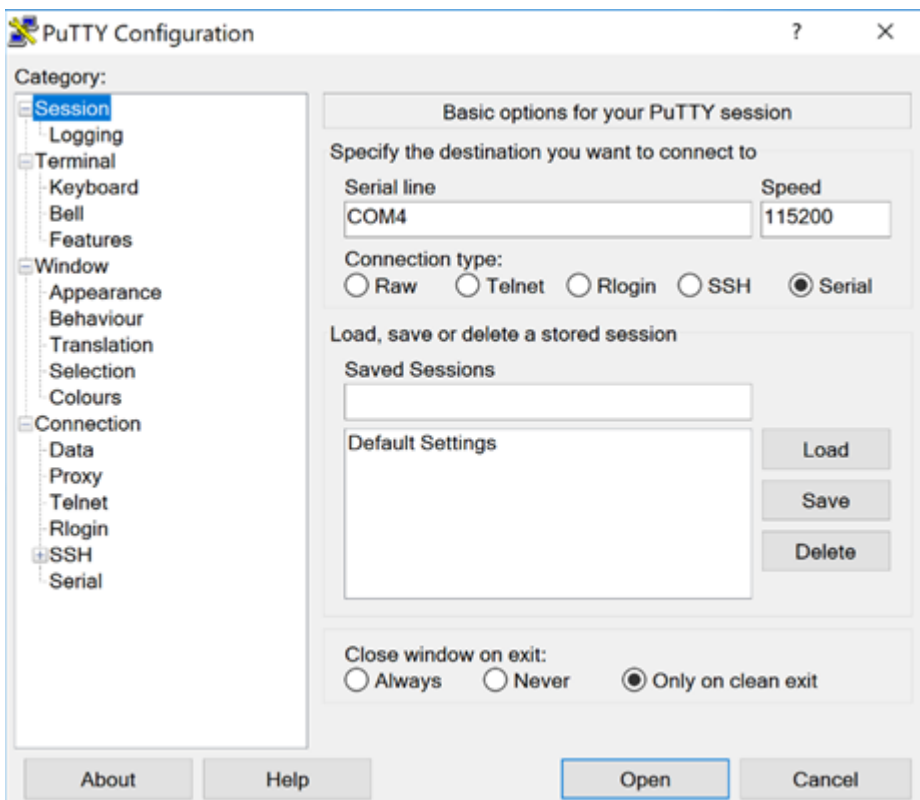
1. Go to your device manager and review your COMM port



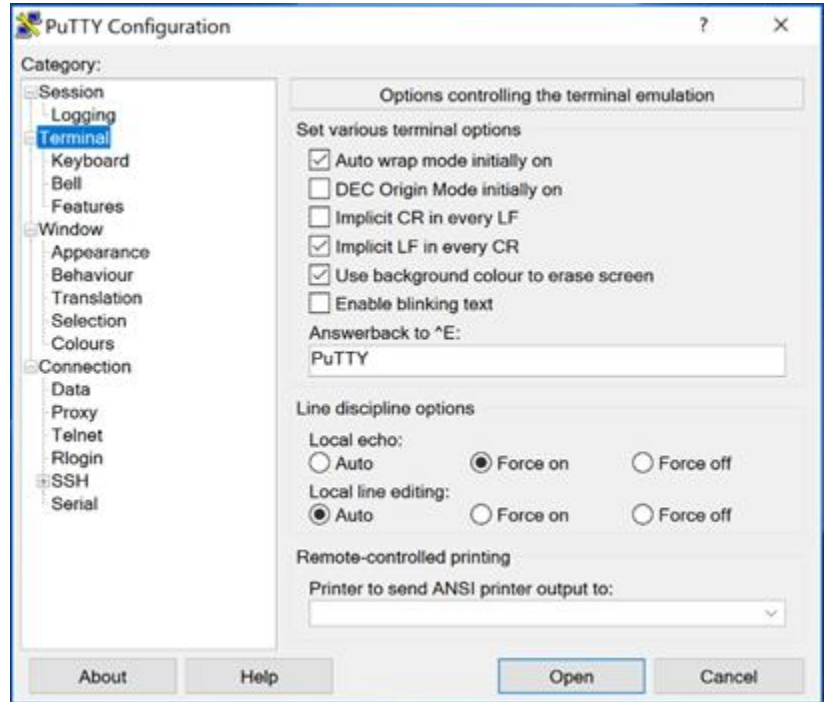
2. Open PuTTY on your desktop



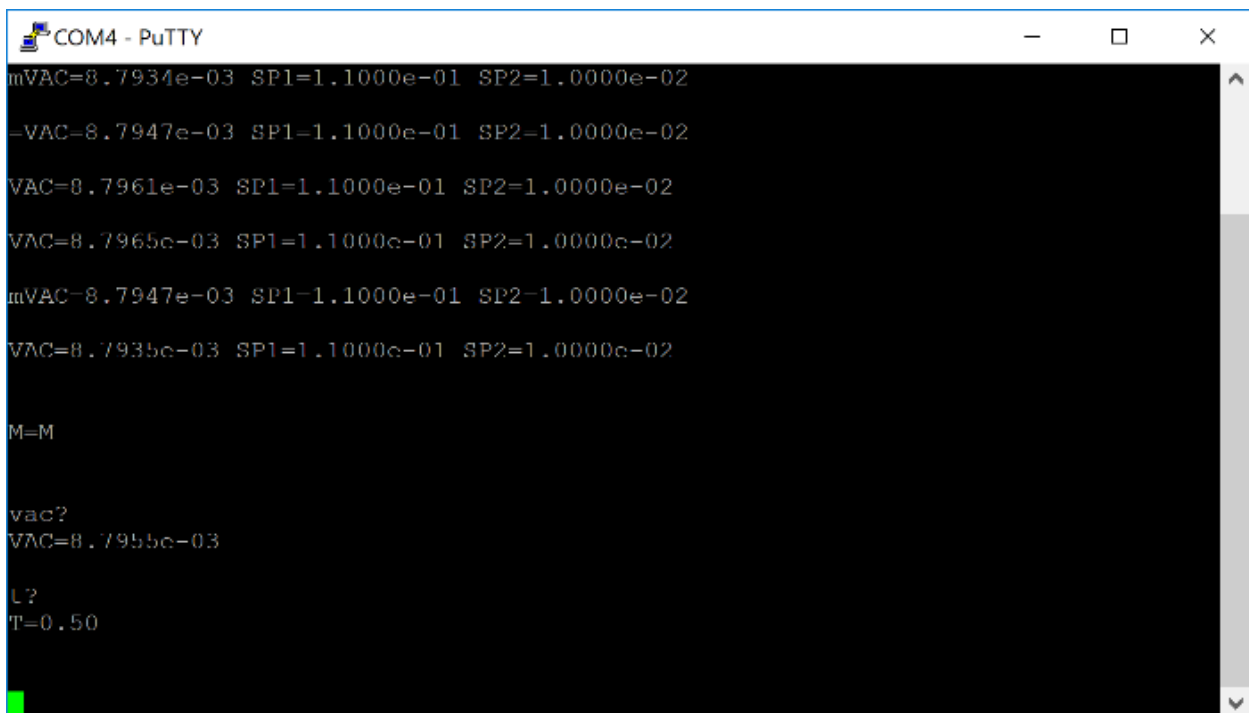
3. Select "serial" as your connection type and set the speed to 115200



- Under "Category" on the left, select "terminal" then select various terminal options. Still on this screen, select "force on" as the Local echo line display. Click open.



- View your vacuum on your desktop!



SECTION 6: FACTORY REPAIRS AND CALIBRATIONS

The vacuum gauge assembly is designed to provide years of trouble-free service, and the liberal internal use of plug-in components make it easily repairable. No field servicing of the unit is recommended, other than replacement of the gauge tube, but factory servicing and calibration are available at a nominal cost and turn-around times of 24 hours are typical.

6.1 FIELD CALIBRATION

Although it is preferable that all calibration be performed at Kurt J. Lesker, field calibration can be accomplished. Before re-calibrating the instrument, it should be ascertained that the instrument is in fact incorrect. In many cases, the problem will be with a sensor that is fouled, or a system that is operating improperly.

SECTION 7: UNDERSTANDING TORR

The Display Unit, and many similar instruments, are calibrated in microns or "millitorr." It is appropriate to discuss what microns are and to relate microns to other measures of pressure and vacuum.

Microns are not really a measure of vacuum at all, but rather of absolute pressure. It will be recalled that the pressure of the atmosphere is 14.696 or approximately 14.7 pounds per square inch at sea level. This pressure is due to the weight of all of the air in the earth's atmosphere above any particular square inch. This 14.696 psi is equivalent to the pressure produced by a mercury column of approximately 29.92 inches high or .76 meters (about 3/4 of a yard) or 760 millimeters of mercury. Atmospheric pressure varies greatly with altitude. It decreases approximately 1 inch of mercury per thousand feet of altitude. It also varies widely with local weather conditions. (Variations of one half inch in a single day are common.) The word vacuum means pressure lower than atmospheric or "suction," but, in describing negative pressure, the atmosphere is only a satisfactory reference if we are dealing with values of vacuum down to about 27 inches of mercury. Below that, it is much more useful to talk in terms of absolute pressure, starting from absolute zero. The Display Unit and all similar instruments do just this.

One TORR, a commonly used unit, is an absolute pressure of one millimeter of mercury. A millitorr is equal to one thousandth of a TORR. A MICRON is the same as a millitorr. The full scale reading of a Kurt J. Lesker is 1999 microns and is equivalent to 1.999 TORR of approximately 2/760 of atmospheric pressure. This is less than .1 inches of mercury, and less than .05 PSI.

SECTION 8: ATTACHMENTS AND ILLUSTRATIONS

TYPES OF KJL ACTIVE GAUGES SUPPORTED

SPARC Name		Electrical Interface	Equation
PiR	KJL Pirani Active Gauges	FCC68 (RJ45)	$p = 10^{((V-c)/1.286)}$ $c=6.304$
CCP	KJL Cold Cathode Pirani Active Gauges	FCC68 (RJ45)	$p = 10^{(1.667 \times V - d)}$ $d=11.46$
CC	KJL Cold Cathode Active Gauges	FCC68 (RJ45)	$10^{(0.75 \times (V-c))}$ $c=12.826$

CAPACITANCE MANOMETERS SUPPORTED FOR KJL ACG AND HCG SERIES

SPARC Sensor ID	Electrical Interface	Description	Equation
0.1	*DB-15	0.1 Torr gas independent gauge for high accuracy measurement	$P=V/100$
1	*DB-15	1 Torr gas independent gauge for high accuracy measurement	$P=V/10$
20	*DB-15	20 Torr gas independent gauge for high accuracy measurement	$P=2 \times V$
50	*DB-15	50 Torr gas independent gauge for high accuracy measurement	$P=5 \times V$
10	*DB-15	10 Torr gas independent gauge for high accuracy measurement	$P=V$
100	*DB-15	100 Torr gas independent gauge for high accuracy measurement	$P=V \times 10$
1,000	*DB-15	1,000 Torr gas independent gauge for high accuracy measurement	$P= V \times 100$

*Requires ADP-DB-15-SPARC Adaptor

OTHER TYPES OF ACTIVE GAUGES SUPPORTED

SPARC Name		Electrical Interface	Equation
523	***MKS 523C Cold Cathode Gauge	DB-9	$p = 10^{(2 \times V - 8)}$
P25	MPG400/401 Cold Cathode Pirani Gauge	FCC68 (RJ45)	$p = 10^{(1.667 \times V - d)}$ $d=11.46$

***Future support with ADP-DB-9-523-SPARC Adaptor

MKS CAPACITANCE MANOMETERS SUPPORTED

SPARC Sensor ID	Electrical Interface	Description	Equation
1	**DB-9	722B 1 Torr gas independent gauge for high accuracy measurement	$P=V/10$
20	**DB-9	722B 20 Torr gas independent gauge for high accuracy measurement	$P=2 \times V$
50	**DB-9	722B 50 Torr gas independent gauge for high accuracy measurement	$P=5 \times V$
10	**DB-9	722B 10 Torr gas independent gauge for high accuracy measurement	$P=V$
100	**DB-9	722B 100 Torr gas independent gauge for high accuracy measurement	$P=V \times 10$
1,000	**DB-9	722B 1,000 Torr gas independent gauge for high accuracy measurement	$P= V \times 100$
0.1	*DB-15	A-Baratron AA01 0.1 Torr gas independent gauge for high accuracy measurement	$P=V/100$
1	*DB-15	A-Baratron AA01 1 Torr gas independent gauge for high accuracy measurement	$P=V/10$
20	*DB-15	A-Baratron AA01 20 Torr gas independent gauge for high accuracy measurement	$P=2 \times V$
50	*DB-15	A-Baratron AA01 Torr gas independent gauge for high accuracy measurement	$P=5 \times V$
10	*DB-15	A-Baratron AA01 10 Torr gas independent gauge for high accuracy measurement	$P=V$
100	*DB-15	A-Baratron AA01 100 Torr gas independent gauge for high accuracy measurement	$P=V \times 10$
1,000	*DB-15	A-Baratron AA01 1,000 Torr gas independent gauge for high accuracy measurement	$P= V \times 100$

*Requires ADP-DB-15-SPARC Adaptor

**Requires ADP-DB-9-SPARC Adaptor

SPECIFICATIONS

Specifications	
Power:	100-240VAC 50/60 Hz CE Rated
Vacuum Interface:	1/8" Male NPT or KF/NW
Sensor: (10' cable length)	Dependent on sensor(s) installed
Range:	Dependent on sensor(s) installed
Units:	Order as: Torr, mBar, kPa
Mount	1/8 DIN or Bench Top
Display	0.40 inch high 6 digit red LED
Dimensions	1.7"H x 3.52"W x 5.35" Deep
Controls	7 amp, 250 Volt (If applicable)
Telemetry Options	USB, Wifi

SECTION 9: TERMS AND CONDITIONS

TERMS OF USE, LIMITED WARRANTY & LIABILITY WAIVER

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